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COMBINED MATURITY MODEL IN NEW PRODUCTS AND SERVICES DEVELOPEMENT BASED ON EESTI ENERGIA EXAMPLE

Masters's thesis
Programme Entrepreneurial Management MAEM20

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Tallinn 2022

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ABSTRACT

Traditional companies are facing the need and challenge to digitalize their organization and move from traditional business to creation of new products and services. Current tools and maturity models are not covering all aspects needed to evaluate status quo within the company. The aim of this study is to create Combined Maturity Model that can be used within product-driven companies. Specifically, it investigates the main components and criterias for high-performance product teams. In this context, three main pillars with 9 dimensions and 32 sub-categories are proposed.

To understand the performance prerequisites and barriers, interviews within expert organization and traditional organization were conducted. Furthermore, the Combined Maturity Model created was tested within expert and traditional organization in order to understand the differences between the two. Responses were analyzed using ANOVA to test coherense within the teams. The results of the Self-assessment Survey showed relatively even difference of 1,8 points out 7 on average in advance to expert organization with 0,68 standard deviation.

The work concludes that existing Maturity Models lack mainly in customer centricity, design applications and psychological aspects, which are deeply embedded in new products and service development. High-performing organization focus and excel in creating culture and purpose, they develop services with customer being at the heart of it, with several iterations through agile and/or design thinking principles and have integrated technology and data across organization. Traditional companies need to adopt cross-functional teams with full autonomy as test case in order to produce successful reference and enable ownership for smaller areas of end-to-end business lines.

Keywords: Maturity Models, Organizational agility, design thinking, customer centricity, digitalization, digital maturity, agile maturity, design maturity, new service and product development

INTRODUCTION

Digital servitization pushes energy companies to radically transform their business model, creating new challenges for its implementation (Latapi, Johannsdottir, & Davíðsdottir, 2020). Driving change in a large, established organization is never easy, but it is even harder in the face of rapidly evolving technology and emerging business models that create huge uncertainties for the future (Gupta, 2018). No sector has been left out of digitalization and with this, Eesti Energia has had to restructure and create digital products and channels to communicate with their customers and offer services. Due to this radical shift of moving from traditional business such as production and distribution of electricity and gas to new offering products and services, has left Energy and other traditional sector companies questioning on how to successfully integrate innovation, increase speed of development and customer centricity in the organization.

Often, the companies that Eesti Energia is competing with are smaller and more agile start-ups in different new product categories. To make this transition successful, traditional companies must learn and adapt the key success components from high-performing, agile start-up cultures. There are many common terms for evaluating the status quo and success probability in the company such as digital maturity, digital readiness, digital transformation index. Further, other maturity models such as Agile maturity model and Design maturity models have emerged, which all play important role in understanding corporate level in activities, methods and cultural aspects in new product and service development. Yet, the existing maturity models suffer from shortcomings to combine relevant components of high-performing, agile product team across different dimensions for one maturity model evaluation. Traditional companies face difficulties in adopting correct procedures and components for making successful transformation and the current tools and maturity models are not covering all aspects to evaluate current situation within the company.

Therefore, the aim of this study is to create combined maturity model that can be used within product-led companies. Eesti Energia will be used as traditional company example and Helmes AS will be used as expert organization example. In order to investigate this topic further and with the relevance to Eesti Energia, following research questions were formed:

- RQ1: What are the main components of high-performance, agile new products and service development organizations and differences with traditional companies?
- RQ2: Why are traditional companies struggling with transformation towards digitalized new products and service development?
- RQ3: How can traditional companies increase performance of in-house development of digital products?

To contribute to this particular question on the aspects of high-performance, agile cultures, semi-structured interviews with key roles in Helmes AS and comprehensive literature review on start-ups were conducted to create better understanding of this. Secondly, the goal is to create self-assessment model and framework that can be used for traditional organization, which will also be tested on Eesti Energia, more specifically on one fully functioning product team. Based on the self-assessment, results and answers to research questions will be formed.

The mixed research method with both qualitative and quantitative method is used in this thesis. Qualitative research method is conducted through semi-structured interviews. The interviews are conducted through web-based video interviews. Directed analysis is performed for structured elements. A quantative method is used to understand the current situation in Eesti Energia and Helmes based on created Combined Maturity Model and Self-assessment Survey by the author.

The master thesis is divided into three main chapters. The first chapter gives overview of the theoretical background of organizational transformation and necessary components based on literature, why these are important and what is the affect and data. Next is content analysis of existing maturity models on digitalization, agility and design. The second chapter gives overview of the research methodology, as well as, the Combined Maturity Model, which was used for the basis of the Self-assessment Survey. Results and Discussion gives answers to the three research questions based on the combination of mixed research and theoretical background. Finally, the conclusion gives overview of the findings and future research.

1. THEORETICAL BACKGROUND & LITERATURE REVIEW

This chapter will give an overview of the 12 different Maturity Models, which were selected for further content analysis in order to track down main components for Combined Maturity Model and cross-examination over selected fields. Additionally, literature review on organizational transformation is given to create better understanding of high-performance product organizations, which will be taken into account in the creation of the Model and self-assessment survey.

This thesis is centered around three types of Maturity Models which all individually contribute to certain aspects of high-performance organizations and the capacity to continuously produce value and innovation into the market. Selected categories are Agile, Design and Digital Maturity models.

1.1 Maturity Models

Different companies and academics have developed maturity models in order to evaluate company in terms of its agility, digitalization or level of design competence. A Maturity Model is a model that reflects the elements necessary for efficiency and describes the path of a gradual improvement from immature processes to regulated, mature processes with higher quality and efficiency (Ilin, Borremans, Levina, & Esser, 2022). A maturity model can provide information about current status quo for particular need and helps to map out possible path towards higher levels of maturity (Berghaus & Back, 2016).

1.1.1 Agile Maturity Models

Organization agility is a complex concept of components, which eventually contribute to ability to thrive in dynamic markets and changing customer demands (Stachowiak & Oleśków-Szłapka, 2018). Agility can be difficult to put to practice and the management must adopt understanding that employees make up the agility, not the organization itself (Wendler, 2014).

For this thesis, four different existing Agility Maturity Models were analyzed based on structure, components and keywords. Additionally, maturity level assessment and cross-examination between other two Maturity Model categories were conducted. Results are brought out in Table 1.

Maturity model	Description	Maturity levels	Components of digitalization	Components of design	Keywords
Organizational Agility Maturity Model **(Wendler, 2014)**	Three main pillars: agility prerequisites, agility of people, Structures Enhancing agility. Two subcategories for each pillar and relevant metric described	0: Non-agile 1: Agility basics 2: Agility transition 3: Organizational agility	Yes	No	Values, technology, workforce, management of change, collaboration, coordination, flexible structures
Agile Capability Framework **(Deloitte, 2022)**	Four different dimensions: Strategy & covernance, People and Culture, Procedures, Technology & tools. Under dimensions are 27 different factors, which are broken down to 100 objects.	0: Agile impeded 1: In transition 2: Doing agile 3: Being agile	Yes	No	Leadership, strategy, vision, customer relationship, continuous improvement, collaboration, IT infrastructure
Agility Capability Maturity Framework **(Stachowiak & Oleskow-Szlapka, 2018)**	Four main agility categories: Strategy, processes, Relations with environment, people. 21 sub-categories for agility enablers and drivers.	0: Zero level 1: Initial level 2: Development level 3: Stable level 4: Improvement level	No	No	Continuous learning, autonomous teams, flexibility, cooperation, continuous improvement, adaptivity, customer-oriented, strategic alliances

Agile Assessment Model **(Tuncel, Körner, & Plösch, 2021)**	Five main agility categories: Embrace change to deliver customer value, plan and deliver software frequently, human centricity, technical excellence, customer collaboration. Additionally, 18 clusters were defined.	Heatmap comparison table between different clusters and organizational units varying between small to large organizational units.	Yes	Yes	Customer involvment, design practices, collaboration, personal growth, flexibility, lean mindset, autonomy & empowerment, data driven, value delivery

Table 1. Agile Maturity Models
Source: (Tuncel, Körner, & Plösch, 2021), (Stachowiak & Oleskow-Szlapka, 2018), (Deloitte, 2022), (Wendler, 2014), Author's interpretation.

The main criterias and keywords that were similar across four studies were continuous improvement and learning, customer involvment, autonomous and collaborating teams, technicality and digitalization. All four models had components of digitalization, but only one out of four embraced design practices component in the maturity model.

Roy Wendler has brought out in his Organizational Agility Maturity Model (2014) set of dimensions for evaluating agility in IT and Service based organizations. These include Agile Prerequisites of Agile Values, such as trust, support, decision-making by employees, handling of change (ibid.). Cultural components are heavily tied with agility, as it is related to people. Deloitte (2022) describe and assess people & culture aspects of the Agile Capability by having continuous improvement culture, set of values and norms across companies and collaboration. Under cultural aspects there is also having people with high qualification and organizational focus on development of people (ibid.). Continuous learning, improvement and personal growth has also been brought out by Agnieszka Stachowiak and Joanna Oleśków-Szłapka in Agility Capability Maturity Framework and Tuncel and colleagues (Stachowiak & Oleśków-Szłapka, 2018) (Tuncel, Körner, & Plösch, 2021). People that are working in agile environments need to be open to change and managers must be able to cope and lead the company through change (Wendler, 2014).

Second important aspect of Agile Maturity Models is use and support of technology across organization which is driven by data, continuous improvement, development and testing practices. (Deloitte, 2022) (Tuncel, Körner, & Plösch, 2021).

Tuncel and colleagues have also brought out Psychological Safety and Unit Autonomy as core principles under Human Centricity (2021). Further, they were the only ones covering design practices and customer engagement in decision making under their principles (ibid.).

1.1.2 Design Maturity Models

Value creation may be evaluated differently and opinions on it may vary between different company and team members. For evaluating design in companies performance different methods and models have been created, which can help to describe the value in different levels of contribution to companies success. Through design, companies can increase understanding between products, services and tehnologies and use it as a strategic asset (Foglieni, Villari, & Visser, 2018). Different frameworks for assessing organizational maturity on design consist of different application used within and general efforts in evolving design processes in the development of products and services.

The Design Ladder describes four different maturity levels for design - non-design with a lack of systematic use of design, design as finishing touch of form giving, design as an integrated development process, and design as a key strategy in business models (Kretzschmar, 2003).

The Design Maturity Model by Invision covers five different types of archetypes based on the experience and depth of design integration in the processes and organization (Invision, 2022). Level 1 being the least mature and Level 5 employing the most mature design practices: Producers, Connectors, Architects, Scientists, and Visionaries (Invision, 2022). The Design Value Scorecard gives Design Maturity overview based on four areas in the organization (Mozota B. B., 2010), the value perspective of customer, performance, learning and financials.

Lastly, Mckinsey and Company have also developed Mckinsey Design Index (MDI) to evaluate companies based on four main criterias: analytical leadership, cross-functional talent, continuous iteration, user experience (Sheppar, Kouyoumjian, Sarrazin, & Dore, 2022). As stated previously, for developing new products and services, cross functional teams are unavoidable in order to do this successfully and customer-centric design must be responsibility of all team members, not for just the designer.

Maturity model	Description	Maturity levels
The danish design ladder **(Kretzschmar, 2003)**	Survey to validate companies positioning in ladder of four blocks.	0: Non-design 1: Design as styling 2: Design as process 3: Design as innovation
Design Value Scorecard **(Mozota B. B., 2010)**	Tracks the maturity of design against four areas of utilization in the organization: customer, performance, learning and financial value.	0: Design as styling 1: Design as process 2: Design as strategy
Design Maturity Model **(Invision, 2022)**	Five different types of archetypes based on the experience and depth of design integration in the processes and organization.	0: Producers 1: Connectors 2: Architects 3: Scientists 4: Visionaries
Mckinsey Design Index **(Sheppar, Kouyoumjian, Sarrazin, & Dore, 2022)**	Four themes (analytical leadership, cross-functional talent, continuous iteration, user experience) of good design, which rates companies by how strong they are at design.	Score of Design index based questionnaire, split into quartiles and compared with other companies.

Table 2. Design Maturity Models
Source: (Kretzschmar, 2003), (Invision, 2022), (Sheppar, Kouyoumjian, Sarrazin, & Dore, 2022), (Mozota B. B., 2010), Author´s interpretation

All of these four frameworks brought out in Table 2 suggest a top-down progression of the design principles from management to each individual in the organization. Top organizations have implemented design in strategic way, within top management or one level below. They use design principles to understand the customer and market, foresight research that assess product market fit and have joint strategy across multiple channels and platforms (Invision, 2022).

1.1.3 Digital Maturity Models

Different scales and archetypes have been created in order to support excecutives on their digital maturity journey (Remane, et al., 2017). The main aim for these types of maturity models is to access the current situation in organisations digilatization. Maturity assessment model by KPMG addresses digital maturity based on operational effectiveness and transformation intensity, hence that it is continuous activity (KPMG, 2022). They divide the companies into four different archetypes shown in Table 3.

Maturity model	Description	Maturity levels	Components of Agility	Components of Design	Keywords
Maturity assessment model **(KPMG, 2022)**	Defining four digital maturity archetypes based on operational effectiveness and transformation intensity.	Reactive participant, digital operator, ambitious transformer, smart digitalist	Yes	No	People, Strategy, governance, culture, customers and channels, digital organization, processes, technology
Industry 4.0 **(PWC, 2022)**	Linear maturity path along the four archetypes with 7 categories of assessment.	Digital novice, vertical integrator, horizontal integrator, digital champion.	Yes	No	Digital business models, digitisation of products and service offerings, data & analytics, agile IT architecture, organisation, digital culture, employees

Digital Maturity Model **(Deloitte, 2018)**	The 5 core dimensions are divided into 28 sub-dimensions, which in turn breakdown into 179 individual criteria on which digital maturity is assessed. Five core dimensions are: customer, strategy, technology, operations, organisation & culture.	Score based on questionnaire, which is compared to similar industries.	Yes	No	Business models, customer experience and engagement, strategy, data & analytics, technology architecture, agile change management , automation, culture, leadership & covernance
Digital Quotient **(Mckinsey & Company, 2022)**	Comprehensive measurement of digital maturity across 5 key dimensions (strategy, organisation & talent, agile delivery & culture, capabilities, adoption & scaling) and 32 management practices.	5-point scale	Yes	Yes	Bold vision and strategy, executive alignment, customer-centricity, leadership, structure & roles, talent skills, governance, agility, IT strategy and architecture, data, continuous delivery, risk appetite

Table 3. Digitalization Maturity Models
Source: (Deloitte, 2018), (PWC, 2022), (KPMG, 2022), (Mckinsey & Company, 2022), Author´s interpretation

PWC has focused their maturity similarly to four archetypes and described all 7 categories level for each archetype (PWC, 2022). Deloitte and Mckinsey both divide the digital maturity into 5 domains, but have different set of dimensions as their core. All of the digital maturity models fail to address the importance of design in the process of digitalization yet include component of agility as one of the assessments.

Mckinsey Digital Quotient (2022) has included strategic perspective as one of the main dimensions, where aspects of customer-centricity, bold and long-term vision, strategic alignment have been brought out. Further, organization and talent, agile delivery and culture and capabilities such as technology and data are included in the assessment (ibid.). Deloitte Digital Maturity Model (2018) has separate dimension for customer, which includes engagement, customer experience, insights & behaviour and perception as sub-dimensions. They have also included strategy, technology, operations and organisation & culture as their main dimensions. They have emphasized importance of data & analytics, culture, leadership, talent management to name a few from sub-dimensions.

Overall, Digital Maturity Models analysed have good coverage across variety of domains, but fail to address importance of design and psychological aspects of the culture.

1.2 Organizational transformation

Transformation towards digitalized company is appealing to senior executives in many different fields. To answer the question what is a digital enterprise, general definition is as follows:
"An enterprise that is transforming itself to meet the challenges of our postindustrial Digital Age, by embracing an adaptive culture, employing technology at its core, and creating new business models" (Highsmith, Robinson, & Luu, 2019).

Roman Teichert has defined digital transformation as something what can be seen as "an ongoing process of adoption to a significantly changing digital landscape in order to meet the digital expectations of customers, employees and partners" (Teichert, 2019).

Any transformation for an enterprise, especially when it comes to large, state-owned companies is difficult. Digital transformations are even harder. Based on the research conducted by Mckinsey & Company (McKinsey & Company, 2022), only 16 percent of respondents say their

organizations' digital transformations have successfully improved performance and also equipped them to sustain changes in the long term.

Digital transformation in digitally savvy companies is not likely to be successful as the success rate is below 26% (McKinsey & Company, 2022). Other important factor among companies is the size. Organizations with fewer than 100 employees are 2,7 times more likely to have successful digital transformation than those with more than 50 000 employees (ibid.). The total headcount in Eesti Energia is over 4800 and for companies from traditional industries, such as oil, gas and infrastructure, the success rate falls between 4 and 11 percent (ibid.).

There is also significant difference between companies with successful transformations and other companies, the biggest difference in different tools and methods used came from deploying mobile internet technologies and design thinking (McKinsey & Company, 2022). Aside from the digital tools, management team establishment of clear change story for transformation had the highest impact for leading companies to have a successful digital transformation (ibid.). From the research (McKinsey & Company, 2022), five main criterias for successful digital transformation were brought up: having the right, digital-savvy leaders in place, building capabilities for the workforce of the future, empowering people to work in new ways, giving day-to-day tools a digital upgrade, communicating frequently via traditional and digital methods.

As stated in the introduction, Eesti Energia is moving towards customer centricity and product orientation. Developing services for customers is something Eesti Energia as a company has not been having to focus on. Until now, the focus has been on mining oil shale, production and distribution of electricity. Changing the strategy towards helping customers in their green transition, new mindset and culture must be adapted in order to bring valuable services with agility to customers.

1.2.1 Culture & Purpose

A company´s digital transformation, including the digitization of its production, business or service model, cannot be sustainable unless it is accompanied by a corresponding change in culture (Spies & Wenger, 2020). From Westrum Organizational Culture Topology comes three different models. First is power-oriented, second rule-oriented and last one performance oriented (Westrum, 2004). Performance-oriented organizational culture that has optimized information flow, trust, innovation, and risk-sharing is also predictive of high performance (Smith, Villalba, Irvine, Stanke,

& Harvey, 2021). Further, companies that are in performance-oriented mindset also encourage people to take moderate risks and focuse on creating culture of belonging and inclusion (ibid.).

Especially in todays world, people are the greatest capital of an organization (Spies & Wenger, 2020). In order to maximise peoples impact on organizations and results, companies and leaders must offer purpose, sence of belonging and autonomy to product teams and team members (ibid.). Employees must be prepared to take responsibility, exchange information, share knowledge and learn together (ibid.).

The ability to lead organizational and cultural change is one of the most important skills that leaders and managers must possess (Forster, 2005). In most cases, any kind of transformation towards digitalization, agility or customer-centricity starts from the leaders of the organization. Despite this, senior leaders must role-model essential behaviors and mindset changes and dedicate sufficient time to the transformation (Aghina, Handscomb, Salo, & Thaker, 2021). The effect leadership plays in cultural changes is significant. Having organization leaders to be in charge of the agility in the company raised the chances of success from average 30% to 75% (McKinsey & Company, 2022). During bigger transformations organizations usually change their top teams, introduce digital-savvy leaders to the company (ibid.).

Existing leaders must adapt new competences to manage change and improve their skillset – such as context-setting agility, stakeholder agility, creative agility and self-leadership agility (Josephs & Joiner, 2006). That is to create clarity of what is needed to be achieved within the organization, engaging key stakeholders and building trust, overvcoming problems and obstacles with creative solutions and using initiative to develop yourself as a leader (ibid.).

Before any significant change can occur, leadership must create suitable soil for fruitful ideas and products. In order to create agile, open and growth-oriented environment, trust and safety must be established and built by leaders of the company, units and teams (Cagan, 2020). Lack of mutual trust between leaders and their teams or between team members result in performance degradation (Highsmith, Robinson, & Luu, 2019).

Further, Amy Edmondson and Bror Saxberg bring out that building culture of learning is one of the most critical tasks of any leader leading a change in the company, as it takes continuous improvement to have long-lasting affects of agile or digital transformation (Edmondson & Saxberg, 2017). This also takes adaption of growth mindset as Carol Dweck describes people with

growth mindset as the ones who believe that their success depends on time and effort andthat anything can be improved with persistance (Dweck, 2017).

Having experience in specific field is vital for the success of the company and something which Eesti Energia posesses across the organization. The product knowledge and industry skills are not the only part of the formula for successful teams. Differentiation between startups from traditional companies, especially the more successful ones, is that they have shared entrepreneurial passion and shared strategic vision based on research done in 95 startup teams in Netherlands (Mol, 2019). Passion is something, which is deeply embedded in entrepreneurship and Cardon and his colleagues (Cardon, Wincent, Singh, & Drnovsek, 2009) define this as "consciously accessible, intense positive feeling experience by engagement in entrepreneurial activities associated with roles that are meaningful and salient to the self-identity of the entrepreneur."

Meaningful work can be, aside from other important factors also be associated with taking responsibility and adopting an ownership mentality within the organization and having sufficient knowledge of the values and mission of an organization, that are also closely tied with ones own values and purpose (Steger, 2017). Important variable inside a product team is that they feel ownership of the product and results (Cagan, 2018). John Doerr has said that in order to deliver successful products in consistent basis we need teams of missionaries, not mercenaries (ibid.).

Cagan states (2018) that vision must describe the future we are trying to create, typically somewhere around two to five years out. The primary purpose of vision is to inspire the teams to want to help them make this vision for the future a reality (ibid.). It shows where the organization is headed (ibid.).

In order to create alignment of vision within the teams it is critical that the middle manager is aligned with the top management´s strategic vision. The more these misaligned managers displayed visionary leadership, the less strategic alignment and commitment were observed among their teams (Ates, Tarakci, Porck, Knippenberg, & Groenen, 2019).

Important aspect related to strategy is also strategic alignment aspect, the level of fit between an organization's strategic priorities and its environment. Although in the current findings the results have been inconsistent, in general the link between strategic consensus and organizational performance is significant, which is highly related to having common set of values and priorities (Walter, Kellermanns, Floyd, & Veiga, 2012). A higher degree of strategic consensus within a

group may facilitate the communication and coordination of actions, create synergies and improve group and organizational performance (ibid.).

Digital revolution is taking place and with this comes new patterns in the markets – this affects how the teams and companies are structured. The business environment is evolving quickly with new competitors, products and customer needs. Secondly, new technology is constantly introduced to the market such as machine learning, the Internet of Things, Big Data and more. Thirdly, as a result of rapid digitalization, data and information is more transparent and public. Customers can affect companies reputation with a single post or bad review against the company. Further, digitalization has increased the need for talent in new specific areas. Due to that, finding and acquiring talent takes more effort from companies, especially for traditional companies who may struggle to offer employees similar flexibilities as in a startup. A traditional hierarchical company set-up is a hindrance to the agile mindset, because autonomy and personal responsibility are central pillars of agile work (Spies & Wenger, 2020).

Before giving overview of traditional hierarchical teams and agile organizations, explanation and overview of agile is needed to give reasons why agility and agile workflows are needed in todays organizations that are dedicated on building new products and services for customers. The traditional organization with static, structural and silo-based design can often be slow moving compared to agile organizations that have rapid learning and fast decision cycles (Aghina, et al., 2018).

Biggest difference according to Mckinsey & Company study on creating agile organization is having rapid iteration and experimentation practices, technology, systems and tools, continuous learning and role mobility (Aghina, et al., 2018). The last one is important in the creation of autonomous teams. Autonomous teams are characterized as independent, empowered, accountable, collaborative, interdisciplinary, transparent (Highsmith, Robinson, & Luu, 2019). Teams must have clear goals and boundaries to play within and with the understanding that their decisions within their rights are not constantly questioned. It is Important to raise responsibility for outcomes within each team member. On the soft end side of values, a high degree of trust must exist within team members. As also shown in the figure 1, the agile teams are interdisciplinary.

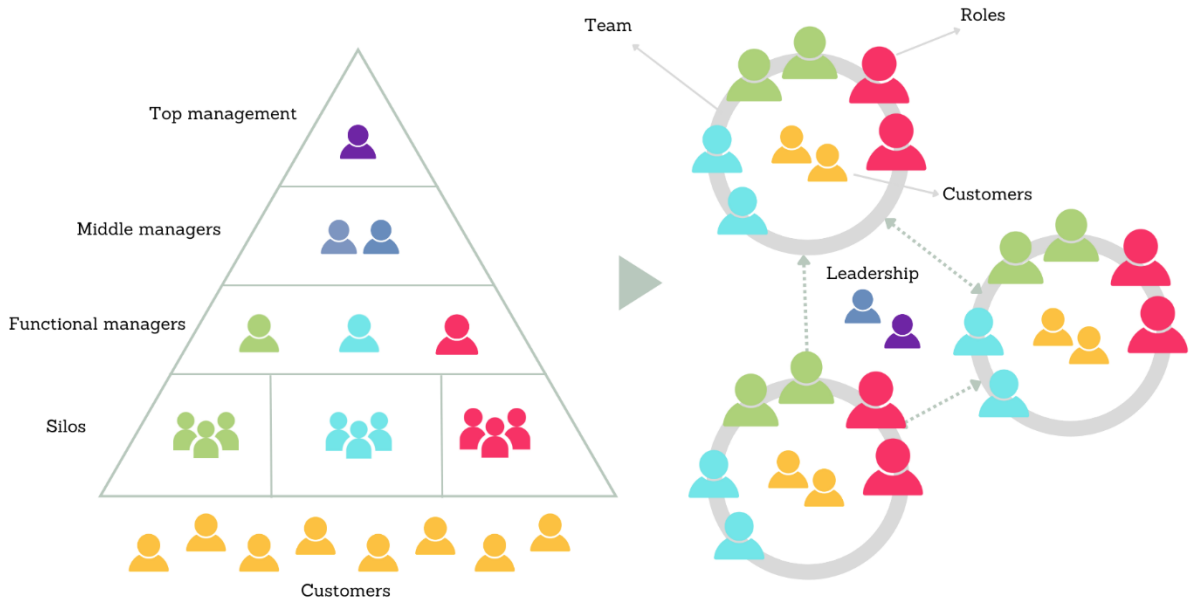

Figure 1. Hierarchical vs agile organizations overview
Source: Adopted (Jost, 2018)

Even for larger, more complex software projects, cross-functional teams with end-to-end ownership help to increase performance and time to market (Chandrasekaran, Gudlavalleti, & Kaniyar, 2014). That means that business or user analysts, developers, testers and business people work jointly on one product, from this comes the meaning of interdisciplinary (Cagan, 2018).

1.2.2 Design & Customer

Development of digital products and services has evolved significantly during the last 10 years. The competition is growing every year as there are more and more elite level companies that develop products and services to the market. Among the competitors and in the development of products and services, one key criteria stands out from rest – customer experience. Customer experience has been defined as “the quality of all of a consumer´s encounters with a company´s products, services, and brand” (Borowski, 2015).

Increasingly important in the equation of customer experience is the digital experience provided by a company. Digital customer experience includes experiences within digital interface such as computer, tablet or a smartphone. Adding digital components to existing customer journey can be challenging - important is that they add value to existing experience. Otherwise, the investments in digital platforms will fail to gain traction and even make the customer journey more complicated

(Borowski, 2015). With digital products, the expectations from the customers is even higher and people have less patience when using services through digital products (ibid.).

In the long run, companies need to identify and build solutions that help to solve important user problems. Introducing creative design processes to the organization and product development process can avoid expensive delays, gain competitive advantage, deliver exceptional customer experiences and uphold employee morale (IBM, 2022).

Design and design process implementation is gaining attention in the management field and the main purpose is that it helps to understand, frame and discover hidden customer problems. Design thinking is still a framework, which is uncommon amongst companies, but is growing more important in each product or service development teams toolkit. Design thinking helps teams see the work beyond product and interface they are creating, as it looks at systems and helps to apply design tools for broader problems (Seiden, 2021). It uses similar ingredients as in agile development processes, as collaboration, continuous iterations, but mostly increasing the empathy which is needed to create truly customer centric products and services (ibid.).

Design processes are mainly implemented in companies through cross-functional teams across different disciplines such as engineering, marketing, operations, design and product and are done through qualitative research in order to achieve thorough understanding of the context and specific problem and also stakeholders wants (Tobi & Kampen, 2017). Solutions are then sought for the problems and opportunities identified through collaborative processes in which visualization tools, customer journey, emotion map and prototyping is allowing ideas to be tested in life-like situations with customers (Legarda, Iriarte, Hoveskog, & Lozano, 2021). By aligning corporate interests with the interests of other stakeholders in the organization's environment, designers generate innovative solutions for complex challenges, seeking a positive result for all parties (ibid.).

The design action plan is a framework that contains a series of action phases that execute the design thinking process. The creator of the design thinking process Herbert Simon (2022) has defined it as "To design is to devise courses of action aimed at changing existing situations into preferred ones." It is a roadmap that tells people involved in a project whether they are going to be on the right track.

Design thinking process follows patterns of thinking, switching between divergent and convergent thinking (Lockwood, 2009) as well as different staging and roleplay approaches (Stickdorn &

Schneider, 2011). It focuses on direct user interaction and feedback, testing prototypes of the product is a fundamental concept of design thinking (ibid.). Design thinking helps to imply better customer experience, as the development of services is customer centric. During the iterative process of design thinking, product teams are improving most critical touchpoints one by one (Kriss, 2014).

Most companies insist that they are customer centric, but lack foundation to prove this in day-to-day business. One indicator may be absence in customer related Key Performance Indicators (KPIs) across organization and different silos (Kilian, Sarrazin, & Yeon, 2015). Secondly, lack of research on customer problem space and customer evolvment in the process may be superficial. Business decision may often be made without evaluating the impact to customers. A comprehensive experience strategy is needed in order to include customers as advocates and secure sustainable revenue and profits (Lockwood, 2009). On the other hand, if the customer experience is not up to expectations, word moves fast especially in todays age of social media and we ran in the risk of not collecting the maximum out of customer life-time-value.

Regarding economic factor and impact, based on research conducted by Anna Whicher, Gisele Raulik-Murphy, and Gavin Cawood on evaluating Design impact on Return of Investment (2011), investing in design showed an additional growth in gross revenue of 250% compared with companies who did not invest in design and shows strong correlation between investments in design and companys growth in revenue.

Study conducted by Aaron Marcus and associates (2005) showed, that by understanding customer expectations and needs, designing the product and product lists accordingly had important affect on sales. Providing sufficient product information to customers at the right time can signicantly alter the conversion of a website or product offering (ibid.). For this, rapid iteration and design thinking process implementation can help to validate what is important for the customers and which kind of information and flow has positive impact on the customer experience and sales generation (ibid.).

Mckinsey and Company (Sheppard, Sarrazin, Kouyoumjian, & Dore, 2018) analyzed and tracked 300 publicly listed companies over 5 years on how they manage design within the company by looking at design action and correlation to financial data. Top-quartile design scorers increased their revenues and total returns to shareholders substantially faster than their industry counterparts did over a five-year period, 32 percentage points higher revenue growth and 56 percentage points

higher total returns to shareholders growth for the period as a whole (ibid.). The Design Danish Centre in their 2018 Design Delivers report, found that 67% of the companies who use design find their competitiveness to improve, 60% of them to a high or very high degree sell more products and/or services and 92% report that design has a positive impact on their bottom line (Danish Design Center, 2018).

Including Design Thinking processes helps also to increase usability of the products. Mantei and Teorey first introduced the topic of cost-benefit analysis of usability engineering and customer involvment back in 1988 (Mantei & Teorey, 1988). Bias and Mayhew, Karat and Lund provide frameworks for cost-benefit analysis and have brought out in their work advantages that drive internal and external Return of Investment (ROI) on usability testing and customer integration in the product development process, which are shown in the table 4.

Internal ROI	External ROI
Increased user productivity.	Increased sales.
Deacreased user errors.	Decreased customer support costs.
Decreased training costs.	Savings gained from making changes earlier in the design life cycle.
Increased saving from making changes earlier in design lifecycle.	Reduced cost of providing training (if training is offered) through the vendor company.
Decreased user support.	

Table 4. ROI of usability
Source: (Marcus, 2004)

Customer experience in general is multidimensional measure, which is “comprised of the cognitive, emotional, physical, sensorial, and social elements that mark the customer’s direct or indirect interaction with a (set of) market actor(s)” (Keyser, Lemon, Klaus, & Keiningham, 2015). Customer experience is really encompassing every aspect of a company’s offering and is internal and subjective response customers have to any direct or indirect contact with a company (Meyer & Schwager, 2007).

On the basis of literature study, there are four main related metrics used by customer centric organizations – kpi (Net Promoter Score), CSAT (Customer Satisfaction Score), CES (Customer Effort Score) and EXQ (Customer Service Experience). Customer experience is highly individual, as people carry different set of background. Hence, different customers may perceive the same service experience differently and can not have the exact same customer experience (Gentile, Spiller, & Noci, 2007). Arne de Keyser has brought in his work four different aspects of customer experience based upon which service and measurement should center around (Keyser, Lemon, Klaus, & Keiningham, 2015): CX is individually intrasubjective and socially intersubjective, grounded in the customer´s own sphere, embedded within a multi-layered market sphere surrounding the customer, event specific, yet dynamic in nature.

Measuring customer experience is the first step in moving towards better service, as Peter Drucker (2006) has said "What gets measured, gets managed." Companies can only improve things that they measure, otherwise there is no information or data suggesting otherwise. The top class of customer experience management companies have clear strategy, understand multi-channel customer experience management, where every touchpoint counts in the overall customer experience and have defined goals for different steps of the customer journey. Further, they use online channels and social media to gather customer insights of the products and markets (Klaus, 2015). As customer experience is a multi-layered concept, companies are not able to gather enough feedback from on single-metric only for making definite conclusions about the service or experience which customers are having (Plassmann, Venkatraman, Huettel, & Yoon, 2015). While managers can still use traditional methods like survey research and focus groups, new research methods that argment conventional approaches are gaining traction (ibid.). Further, social media tracking techniques help gather insights on customer perceptions and provide opportunities to reply and listen to customers in real-time (ibid.). Futher, neuroscientific techniques have grown more popular in order to get insights on customer experience and the unconscious processes that take place in each touchpoint of the service (ibid.).

Based on findings in Phil Klaus and his book, "Measuring Customer Experience" (2015), measuring customer experience alongside with more traditional means, such as customer satisfaction and NPS are better predictors of customer behaviour. Experience quality had better performance against predictibility in three separate categories – customer loyality, word of mouth and share of category (Klaus, 2015). Customer experience quality defined by Phil Klaus divides

into three main categories – brand experience, service provider experience and post-purchase (Klaus & Imhof, 2019).

Regarding the trust and experience over time by customers, increasing customer satisfaction over time defines and reinforces positive, resonant, and differentiated core values for the brand (Lockwood, 2009). As decreasing customer satisfaction characterizes negative or irrelevant values for the brand (ibid.). Brand satisfaction can therefore be looked as sum total of brand experiences minus brand expectations (brand touchpoints over time) (ibid.).

This goes to show that customer perspective change over time and the perception of customer view on brand and service satisfaction is influenced by each touchpoint. What design thinking is centred around is the optimization of each customer touchpoint, which helps to think about the service holistically and empathize customer feelings and thoughts along the journey.

1.2.3 Technology & Data

Companies and technology experts are witnessing the growing role of technology in the company, where technology is not just a supporting software function but is at the core of every company that has carried out successful transformation (Shukla, 2020). Even for traditional companies, tech and IT are inevitable part of the organization and business. Being able to deliver software quickly, reliably, and safely is at the heart of technology transformation and organizational performance (Smith, Villalba, Irvine, Stanke, & Harvey, 2021). This goes for both internal software and platforms as well as for customer products. Traditional companies tend to struggle with legacy technology and complex processes, while often complacent in the belief that their leading market position is secure because they have been in that position for a long time (Cagan, 2020).

Most companies view IT and technology as server of the business. In most start-ups and strong product companies, technology is the business and it helps to solve key customer problems faster than ever before. As Marty Cagan (2020) has stated – “the purpose of the product team is to serve customers by creating product customers love, yet work for the business.”

For evaluating performance of IT and likelihood of companies achieving its targets, software delivery and operational performance must be tracked and measured. This gives good indication of where the company sits in terms of IT and its link with business. General recommendation is to divide development operations metrics into two categories (Forsgren, Smith, Humble, & Frazelle, 2019). First category of metrics tracks the overall throughput and stability (ibid.). Main suggested

metrics for software development is deployment frequency for evaluating how often does organization deploy code to production or release it for end users and lead time for changes to understand the time between code committed to code successfully launched in production (ibid.).

Although being performance driven is mostly cultural, aspects such as data driven, ways of working and continuous automation is evaluated under this chapter. Cultural aspect of performance orientation is lead by leaders as Peter Drucker has brought out that organizational performance capacity is determined by decisions executives make about the people (Drucker, 2006). Measuring performance is becoming increasingly popular and important in implementing business strategies in organizations (Bouckaert & Peters, 2002).

Companies tend to measure and manage performance through lagging indicators which can not be influenced before actually seeing the results, compared to successful companies who have also integrated performance-management into critical process inputs (Ellis, 2017). Companies, especially startups are becoming more focused on defining North Star Metric (NSM) for the company, which is defined by Sean Ellis as follows – "best capture of the core value that your product delivers to its customers" (ibid.).

Launching North Star Metric across the organization has many benefits and it helps to prioritize,-simplify decision-making, aligment in the team and keeps focus on product-led growth (Cutler & Scherschligt, 2019). The North Star Metric is matched with the idea of customer centric organization. In order to properly track North Start Metric, companies must increase the engagement in data and increase the amount of datapoints (ibid.).

Continuous tracking of North Star Metric requires engagement of data and data driven cultures as the amount of valuable data is increasing. A data-driven culture is characterized by a decision process that emphasise testing and experimentation and where data not opinions is the basis of decision making (Berndtsson, Forsberg, Stein, & Svahn, 2018). As long as teams keep learning from mistakes and adjust accordingly, failure is accepted (ibid.).

There is a noticeable difference on how startups and companies with succesful digitalization background handle operations, processes and ways of working. One of the founders of Scrum development methodology, which is wildly used in software development, explained it was created initially in order to make faster, more reliable, more effective software in the tech industry (Sutherland, 2014). Making better software is relevant for any company including traditional

companies nowadays, hence, why running optimal processes and operational strategies is important. Rick dove has defined agility in his book “Response Ability: The Language, Structure, and Culture of the Agile Enterprise“ (2001) as „the ability to manage and apply knowledge effectively, so that an organization has the potential to thrive in a continuously changing and unpredictable business environment.”

Jeff Sutherland and Ken Schwaber along many other software developers formulated agile manifesto, which is wildly used software development stating the essence of agility (Beck, et al., 2001): individuals and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation and responding to change over following a plan.

Based on study by Mckinsey & company, companies that have adopted agile methodologies and ways of working typically delivered around 30 percent increase in efficiency, customer satisfaction, employee engagement, and operational performance and made the organization five to ten times faster and signifanctly increased innovation within the organization (Aghina, et al., 2018). Additionally, companies see benefits from quicker fault elimination due to shorter iterations (Fergis, 2012), adaptibility to change, which helps to come up with the most ingenious solutions due to continuous learning (Schwaber, 2022).

Today, there are many different forms of agile development and different methodologies, for an example XP, Agile Modeling, and SCRUM. Traditional scrum methodology consists of three main process steps – planning and system architecture, sprint and closure. Sprints are used to solve tasks and problems in iterative model. In addition to the practices defined for agility, scrum also involves building a product backlog for continuous iterations (Ow, 2009). A product backlog is defined as a place where one can see all requirements pending for a project, complexity and development days or some other unit which has been agreed within the teams. (ibid.)

Growing product-led teams and team environment in modern organizations is one of the main priorities, as this directly affects employee satisfaction, cooperation and results in the end. A primary benefit of creating team environments is the affordance of multiple skills, training and experience, effective information and knowledge sharing (Roberts, Stanton, Fay, & Pope, 2019). Although COVID-19 has had substantial impact on ways of working and has shifted teams working more remotely, co-location remains important part of succesful teams. Co-location,when

applied well, can increase accountability, communication, coordination and have shorter iterations (Chandrasekaran, Gudlavalleti, & Kaniyar, 2014).

Virtuals teams have mainly two challenges that alter maximising productivity. Daily task may take more time due to less collaboration, giving and receiving help is more complicated and team members tend to communicate in one to two people groups and not with the whole team (Lechner & Mortlock, 2021). This leaves informal discussions to be within smaller isolated groups. Spontaneous and informal information is crucial part in increasing the feeling on cohesive team, increasing trust and enable corrective feedback in instantenous feedback (Morrison-Smith & Ruiz, 2020).

In general, Eesti Energia has its product teams located within silos. Product, design, IT, sales, execution are all located in separate floors and execution in separate office building. Eesti Energia has also moved towards co-locating teams with one separate team focusing on e-mobility products and services, which is also going to be used within this thesis. The team consisting of business development, product development, sales, execution and operation are all co-locating on the same floor and in one room. Team members have brought out benefits such as immidiate flow of information between sales managers, product managers and vice versa. Product managers have better touch with customers due to continuous feedback from customer problems, suggestions and success stories. On the other hand, sales roles are more informed and up-to-date regarding changes with the products and services. IT team is currently operating over virtual teams as team is located internationally, but something to consider in the future is to locate dedicated designer(s) and IT development team to same rooms in order to increase feeling of belonging and cohesivness.

Although co-locating is important for deeper connections and relationships between team members, organizations need to additionally put effort into building digital strategy and platforms to increase transparency across activities and teams. Companies are increasingly relying on information technologies, knowledge processes, and communication technologies that enhance their agile ability (Sambamurth, Bharadwaj, & Grover, 2003). Using digital platforms and cloud-based collaboration tools to share and openly collaborate on projects, products and continuous overview of results alter the speed of development and enables organization to be more nimble to react to outside events. As the digital world is constantly evolving, it is critical to embrace and adopt new technologies and keep technical competence across teams (Gonçalvesa, Bergquista, Alängeb, & Bunka, 2022).

Startups tend to prioritize digital tools depending on how well they harmonize with their needs, agile behavior, and values. Mostly, they use cloud-based solutions such as Slack, Microsoft Teams, Google Drive etc, for quick and smooth collaboration (Gonçalvesa, Bergquista, Alängeb, & Bunka, 2022). Additionally, Google Cloud Platform, Jira is often used as a development environment toolkit (ibid.).

Eesti Energia has seperately implemented digital workspace product owner to carry out strategy and tool development within the organization. Eesti Energia uses mostly Microsoft teams or Confluence for documentation of materials and Jira in the IT develoment processes. Additionally, for team collaborations, brainstorming sessions, team work over product ideation and problem setting, Miro has been introduced in the process. Miro have been brought as a digital tool to teams as more and more collaboration is being done over virtual teams. Teams have also been collaborating within Figma, which is for user experience and user interface design, where team members can leave immidiate feedback for designers, enabling rapid iterations of the product. This enables teams to not only rely on one person ideas and production, the tools enable to take an outside view of the experience in order to create best possible solution, which is also emphazised in the book “Lean UX” by Jeff Gothelf and Josh Seiden (Seiden, 2021).

2. RESEARCH METHODOLOGY

The second chapter gives overview of Combined Maturity Model proposed for this thesis. Further, an overview of the research methodologies and statistical approaches applied in the current research is given. A pragmatic approach is used in order to create Combined Maturity Model, which will be tested on two different organizations - Traditional (Eesti Energia AS) and Expert (Helmes AS).

2.1 Combined Maturity Model

The following chapter covers the main aim for the research. Based on the thematic literature overview of existing Digital Maturity Model, Design Maturity Model and Agile Maturity Model, the initial Combined Maturity Model is created, which was used for the basis of questionnaire. High-performance, agile organizations are created with mixture of components. Although different, there is no one formula for success, certain components standout from the literature. Cultural aspects combine the first pillar of the maturity model. Top companies have set clear values for the whole organization, which are embedded in each team and individual. Evaluating potential employees in the hiring process is strongly tied with how well the persons value fit with the organizational values. Cultural aspects of the company must come from top-down starting with the executives, as they are role models in the company. High-performance teams are setup as cross-functional teams, that can develop value from start to end. Organizational agility is highly tied with having autonomy within product teams to minimize handover process.

Based on the review on existing Maturity Models, cultural aspects were included in all three with the common factors being autonomy, leadership & governance, agility & flexibility, lean mindset. Further, based on Tuncel, Körner and Plösch maturity model (Tuncel, Körner, & Plösch, 2021), personal growth and empowerment were covered, which was also strongly brought out by experts in semi-structured interviews. Having clear and bold vision for the future helps organizations to create fellow feeling where teams are pulled by the similar goal. This is also why common goals and metrics are introduced in teams where every member is responsible for execution.

Second pillar for the initial Maturity Model is design & customer. Based on the analyse on digital and agility Maturity Models, almost all models have customer, customer centricity and experience management embedded in the models. Yet, aspects of design and design thinking have not been

addressed. Design thinking increases the involvement of customer or end-users in the product development process, as well as empathy, which is also important component in organizational culture. Product and service development processes that have introduced design processes are also more focused on solving the right problems, not finding customer for solutions (Savoia, 2019). Third important aspect is the technology, which is also covered in all the agility and digital maturity models.

The three pillars of the Maturity Models are Culture & Purpose (P1), Design & Customer (P2), Technology & Data (P3) (see Figure 2)

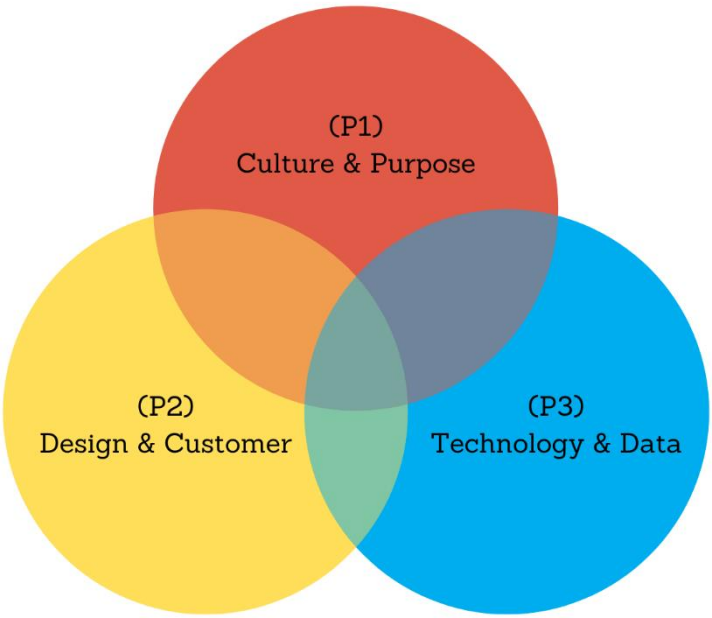

Figure 2. Three pillars of Maturity Model for Transformation
Source: Author

Additionally, 9 dimensions were created under main pillars, three under each pillar as description and component of agile and digitalized organizations. Hence, the dimensions of the maturity model incorporate a structure of organizational performance capability, that is grounded in theory, empirical investigation as well as also existent in practice based on semi-structured interviews. See table 5 for combined Maturity Model.

Pillars	Dimensions
Culture & Purpose (P1)	Organizational agility (D1)
	Leadership (D2)

	Strategy & Vision (D3)
Design & Customer (P2)	Design (D4)
	Customer Centricity (D5)
	Customer Experience Management (D6)
Technology & data (P3)	Data (D7)
	Operations & Processes (D8)
	Technology (D9)

Table 5. Maturity Model Pillars and Subcategories
Source: Author

The list of sub-categories with individual statements are covered under the Results & Discussion chapter.

2.2 Methods

The research consisted of both qualitative and quantitative research (mixed method). Semi-structured interviews were used with 4 members from traditional organization and 3 from expert organization. In order to understand main performance differences between traditional and expert companies, self-assessment survey was conducted based on the created Combined Maturity Model. The main aim for the semi-structured interviews was to get feedback for the model as well as to get comprehensive overview of the culture and ways of working of the expert organizations. Different set of questions were formed for interviewing traditional organization to get overview for RQ1 concerning main barriers for traditional companies in digitalization, agility and product development. Research methods used are also shown using Saunders method (Saunders, Lewis, & Thornhill, 2019) in figure 3.

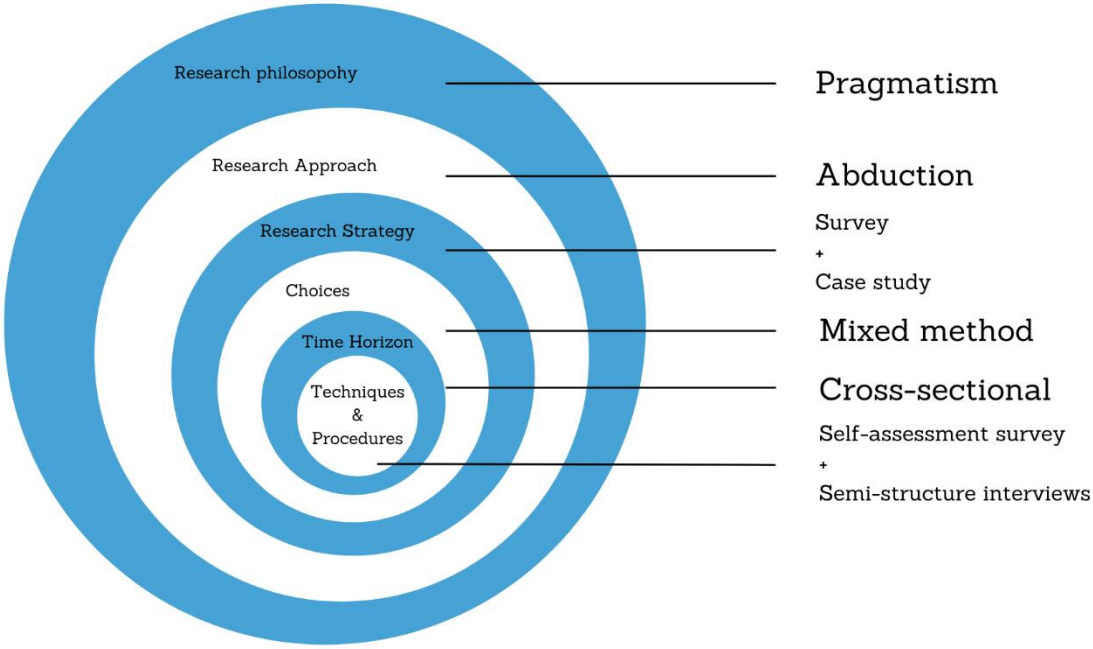

Figure 3. Research Method used

Source: Saunders Onion, Authors modification

After finalization of the Maturity Model, assessment tool was created based on questionnaire, which was conducted with Microsoft Forms and is based on self-assessment model inside the organization. The aim with the survey was to get overview of organizational performance in each pillar, dimension and sub-category in order to compare the differences and create better understanding of high-performance, agile organizations. The assessment on traditional company was carried out on one Eesti Energias sub-brand – Enefit Volt, as Enefit Volt has separate IT team developing software solutions for customer as well as hardware solutions. It will mark that the roles in business & product development and IT are dedicated to one service and brand only. Marketing, design and processes are cross-product roles. The same self-assessment survey was then conducted in Helmes. In total, 18 respondents answered the self-assessment survey during the period of 13.04-05.05.2022. Self-assessment survey was designed based on the Combined Maturity Model and was divided into four sections. The survey first gathered information about company and role, which was later used for gap analysis between roles and organizations. In order to analyse maturity in each pillar designed in the maturity model, the rest of the survey was divided into three sections: Culture & purpose (P1), Design & Customer (P2), Technology & Data (P3). Under each sub-category an example statement was created for participant to vote on Likert 7-point scale (Likert, 1932) ranging from strongly disagree to strongly agree. The questionnaire was

conducted through Microsoft Forms platform. Responders identity was kept anonymous for this survey and no personnel data was collected.

2.2 Analytical approach

In the first section, the survey gathered information about the organization and particular role – IT, Business development, Leadership, Marketing, Processes and Design. Data was then analyzed within Microsoft Excel Data Analysis tool. Mean scores within companies with standard deviation were calculated.

Additionally, for data and difference between different roles one-way analysis of variance was conducted. Since p-value is less then given significance level 0.05 for this test, we can conclude there is a no difference among the competence areas of the participants. After conducting the ANOVA analysis, post hoc test was conducted using Tukey-Kramer Procedure (Tukey–Kramer Method, 2013), which showed no signicant difference across roles in both companies.

In order to visually depict companies maturity in each maturity pillar, polar graphs were generated ranging from one to seven, with seven being equivalent to the highest maturity level. The findings and results were then compared within one polar graph in order to visually show differences between companies. For this, mean scores were calculated across both companies.

Limitations with the self-assessment survey is that it does not take into consideration the background and level of expertise, job experience in years. Additionally, it is intended to evaluate organizational mean maturity and not evaluated within each different team.

Interviewers number	**Position**	**Years in company**
INT1	CIO	20
INT2	Team lead	5
INT3	Head of Digitalization	2
INT4	Product Owner	3
INT5	Head of Design	2
INT6	Business Digitalization owner	3

INT7	Process Manager	1

Table 6. Interviewer´s numbers
Source: Author

The interviewers' identities are anonymous within this research and the correctness of their citations was confirmed by the interviewer prior to making them public. However, the position of the interviewer and the working years within current company are shown within table 6. The interviews were conducted in Estonian language and transcribed with Advanced Rich Transcription System (Alumäe, Tilk, & Asadullah, 2018).

3. RESULTS & DISCUSSION

The previous section described the process of creating the Combined Maturity Model and self-assessment survey, which was the main aim for this thesis. This section is going to first and foremost give overview of the self-assessment conducted in both companies. Then, clarity to main problem statement and research questions are going to be answered, based on the literature study and research conducted. As noted in the introduction, the underlying problem that this thesis addresses is lack of unified Maturity Model that addresses cross-functional dimensions that are critical for new products and service development. Hence, on the basis of existing maturity model across different fields, literature study and input from interviews with expert organization, this chapter is going to give understanding of components for high-performing and agile new product and service teams and organizations. From the self-assessment survey and interviews, set of differences between expert and traditional companies will be addressesed through Radar Chart. Secondly, the main possible barriers and limiters for successful transformation within tradtional companies are going to be adressed. Lastly, possible strategies and focus areas are going to be proposed to overcome such shortcomings.

Research question number one was about ingredients of the high-performance, agile new products and service development teams. As stated previously, there is no one formula for successful teams, but there are important prerequisites that more often than not lead to value creation. From the Combined Maturity Model created in Chapter 2 the main components remain. After finalization of the main pillars and dimensions, sub-categories were developed within the model, which are important components for high-performing product organizations and teams. These statements are used in the self-assessment survey to assess the maturity over different sub-categories. (See Table 7)

	Sub-category	Statement
Question 1	Structure and roles	Teams are working in a flat organizational structure and agile roles have been introduced to development processes (Agile coach, Product owner, etc.).
Question 2	Cross-functional cooperation	Company is focused on cross-functional teams that deliver end-to-end value and have minimal handover in the process.
Question 3	Entrepreneurial passion	People in the organization are passionate about entrepreneurship and self-identify themselves as entrepreneurs.

Question 4	Co-location	Different competences and functions are co-located and are able to have face-to-face interactions.
Question 5	Autonomy	Cross-functional teams that are dedicated to specific objective can take decisions autonomously without managerial approval and every team member is accountable for the results and outcomes.
Question 6	Degree of expertise and talent acquisition	People in the organization are experts in their specific field and function.
Question 7	Empowerment & purpose	The work that I am doing serves a greater purpose and it is constantly being brought out across the organization. People feel like they are part of a larger cause.
Question 8	Strong values	I can easily name the core values of my company and people live by these in their daily work.
Question 9	Level of transparency	People and managers are transparent in their work and decision-making, information flows within the company without barriers.
Question 10	Implementation of learning routines	I receive continuous training and learnings for my specific field of expertise.
Question 11	Explicitness of vision and strategy	We have clearly defined vision statement and ambition for the future and set our strategic steps accordingly.
Question 12	Strategy alignment	Decision makers priorities are based on demands from customers and the market by an organization.
Question 13	Strategy consensus	There is an agreement on strategic priorities between different layers of the organization.
Question 14	Workplace and tools	Cross-functional teams have access and are specialists in using different design-thinking tools (e.g. Customer personas, Customer journey mapping).
Question 15	Design integration to product development process	We are using design-thinking steps within product development process (Empathize-Define-Ideate-prototype-test).
Question 16	Experimentation and testing	We are constantly experimenting, running A/B or multivariate tests and racking the results of tests and experiments.
Question 17	Customer engagement in development	We have integrated customers in the product development processes via customer interviews, user research and have mechanisms in place to recruit customers for testing of prototypes, products etc.
Question 18	Ecosystem approach	We have strategic focus on partnerships and how joint value is created from it.
Question 19	Customer Insight & Experience	We have systemic way of gathering customer insights and experience across projects and teams.
Question 20	Customer related KPI as a main metric	We have customer related KPI (e.g. NPS, EXQ, CSAT, CES) in place and shared across functions.
Question 21	Continuous management of customer feedback	We have mechanisms and systems in place for managing customer feedback and have defined clear activities and responsibilities within the process.

Question 22	Customer feedback is affecting decision-making	Executives and teams prioritize decisions that take into consideration customer experience. Decision making focuses on customers not only the company.
Question 23	North star metric and KPI-s across organization	Teams and employees are directed by North Star metric, which is tied to vision and common purpose. The North Star Metric is used across the organization and is similar to different silos and roles.
Question 24	Strategy and decisions made based on data	We have easy access to results and data from operations. We use data in our everyday work life to make decisions on objectives, strategy and vision setting.
Question 25	Continuous tracking of results and data	A performance-management system is used to continuously track actual results compared to business targets.
Question 26	Process automation	Our company prioritizes automation and standardization of processes. Automation solutions are designed to connect applications across your business and facilitate data exchange between those applications resolve the issue of lacking the right data.
Question 27	Ways of Working	Ways of Working is led by connection, belonging, trust, speed, and momentum. Teams are motivated and keen on bringing successful outcomes and results to the company.
Question 28	Workplace and tools	Tools and workplace enable fast information sharing between teams and team members without minimum friction.
Question 29	Architecture	Teams use automated testing with rapid and continuous realises of product and code. Parts of the process are done in parallel. Advanced supporting tools and infrastructure are used.
Question 30	Digital workspace	We have digital workspace strategy in place with set of digital tools, platforms and technologies that support employees to communicate, work and produce value for customers and the company.
Question 31	Digital first in customer solutions	All our customer offerings are digitized and enable fast scaling.

Table 7. Self-Assessment Questionnaire
Source: Author´s self-assessment survey

The second column in the self-assessment survey table defines a unique abbreviation for each item, which is used to reference the items. Strong product teams are led by bold vision, a belief, which is deeply rooted within the team members and with progress towards it held constantly on track by a North Star Metric. It is important for team members to feel importance and meaning in the work they are doing (Rozovsky, 2015). For the organization and team to work with minimum friction between the members, there must also exist strong consensus within the organization. As a higher degree of strategic and vision consensus improve synergies, improve communication and overall organizational performance (Walter, Kellermanns, Floyd, & Veiga, 2012).

The existing Maturity Models covered in chapter 1 did not include joint North Star Metric as one of the key components when assessing organizations and teams. One interviewed brought out common goal as follows INT7: "…The success criteria you would make are sure to have a goal in mind. Some kind of time frame for which moment it must be filled. These long goals, the kind of stars you want to go to."

As of this, the first component for Combined Maturity Model was Culture & Purpose (P1), that are strongly related to set of values the teams and people carry within the organization. The following components were mentioned regarding cultural aspects of the organizations:

- Trust between team members
- Transparency
- Autonomy and responsibility
- Continuous learning and development
- Culture that enables experimentations and tests
- Unified goals and metrics
- Unified set of values
- Care

Care for the other team members, work, customers and future have had strong impact in performance and results of Helmes product development teams. Aspect and attributes of care was not being addressed in the literature or existing maturity models as much as it was brought out by all interviews conducted with expert organization. As comment from interviewers addressed this in multiple cases when asked about differentiators of mediocre and well-performing. Existing maturity models and proposed model, lack in psychological aspects of the teams, such as psychological safety and trust. Prerequisite to trust is care, which is not discussed or mentioned in the existing Maturity Models.

INT1: "…number one is caring for the well-being and awareness of these people. Caring is not limited to our people, this caring is the same for our customers. And there, caring is not limited to people, but also to the business. The fact that we can create an environment where people are happy and successful for a long time." And continues "…those teams and those leaders who cared about their people, who were good and wise, demanding and caring leaders, were more successful in the long run."

One of the aspects that increases sense of care within the organization is contributing to learning and development of employees. “An ethic of care conceptualized as a form of interpersonal inquiry can foment a learning organization within a culture of care and trust. A caring culture is a moral environment that is sensitive and responsive to a broad range of stakeholders. Caring does not preclude self-interest or the profit motive but it does establish a commitment to knowing and acting on behalf of others” (Hamington & Sander-Staudt, 2022).

Aside from monetary motivations, people need to grow in order to feel fulfilled. INT2: “…The salary aspect needs to be covered and satisfied; this is number one. Secondly, continuously giving opportunity and new challenges to people. And give a chance to grow professionally.”

The culture of successful organizations enable autonomy for product teams. This is also overlapping theme within literature study on the topic. Evolving autonomous teams within the organization has effect on participation and involvement as well as increased emotional attachment to the organization, resulting in greater commitment, motivation to perform and desire for responsibility (Mohagheghi, 2018).

Creating fully autonomous teams requires having the right people first. Expert organizations, that are fully focused on developing high-performance product teams enable teams to have full responsibility as well as eliminating any friction or bureaucracy for the teams. INT1: ”We are creating teams, which are one hundred percent autonomous, that is, the team has all the competencies to develop a business-critical product from start to finish.” Hence, the team combined must be cross-functional, covering all business-critical aspects of building a successful product.

When comparing two companies in Culture and Purpose (P1) based on the 7-point self-assessment survey explained in Chapter 2, the main differences were related to cross-functional teams autonomy, that had a mean score of 2,5 out of 7 for Eesti Energia and 5,9 for Helmes. Expertise and empowerment of the teams received relatively good scores for Eesti Energia in this pillar with 5,4 and 5,3 respectively. Autonomy, transparency and continuous learning were brought out within existing maturity models, literature and expert interviews, which all had below neutral scores of 2,5, 3,3 and 3,7 respectively. These are the same aspects that Helmes is focusing on strongly based on interviews conducted. Overall average scores were 4,1 for Eesti Energia and 5,8. (See Figure 4)

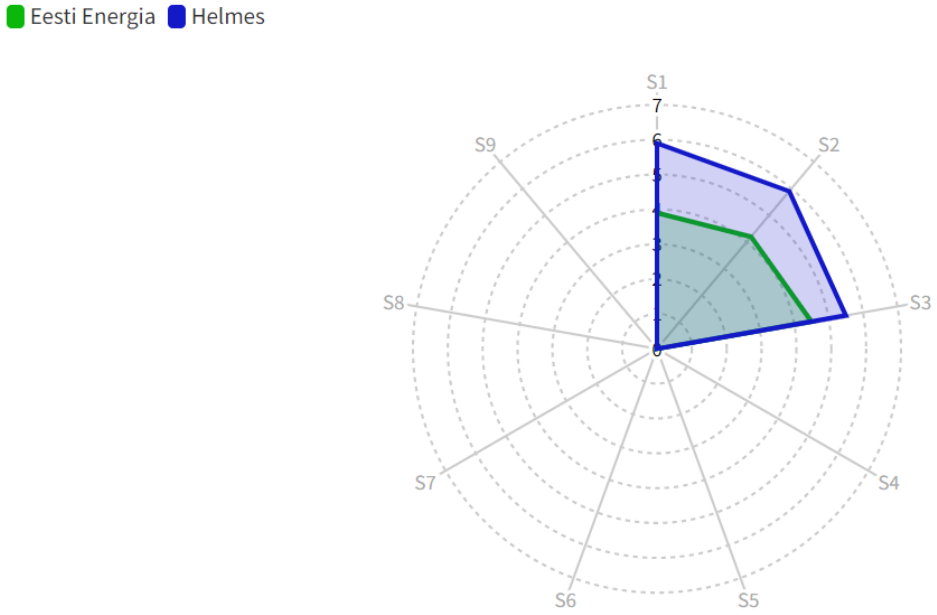

Figure 4. Culture & Purpose pillar radar chart
Source: Author´s calculations

Still, the traditional organization is moving towards agile structures and organizational set-up with cross-functional teams and agile roles such as scrum master, product owner and many more.

Second component selected was Design & Customer as design and design thinking principles have grown more significant in the product development processes, which existing agility or digitalization models hardly mention. As modern design and design principles focus on customer first, understanding their problem space, it helps to achieve greater levels of customer-centricity. This is also mentioned and brought out in existing agility and digital maturity models. INT6: "…Successful product development must first and foremost recognize that everything they do to go about something, such as a customer's desire or goal, must be at the heart of it."

One of the key components of design thinking is empathy, which is constantly being practiced along the iterative process. Empathy towards customers can be possible way to increase psychological aspects of the team such as care and trust. Otherwise, design thinking process may fail to deliver desired results without openness to share ideas.

Expert organization that has been included within this thesis has separately created a role of Head of Design. This role has the responsibility of facilitating design thinking principles across teams and organization. This is widespread trend amongst many similar product development companies,

for example Nortal AS. Although, customer centricity is deeply rooted within Eesti Energias strategy for many years, the overall mean scores for this were noticeably different between the two organizations. (See Figure 5)

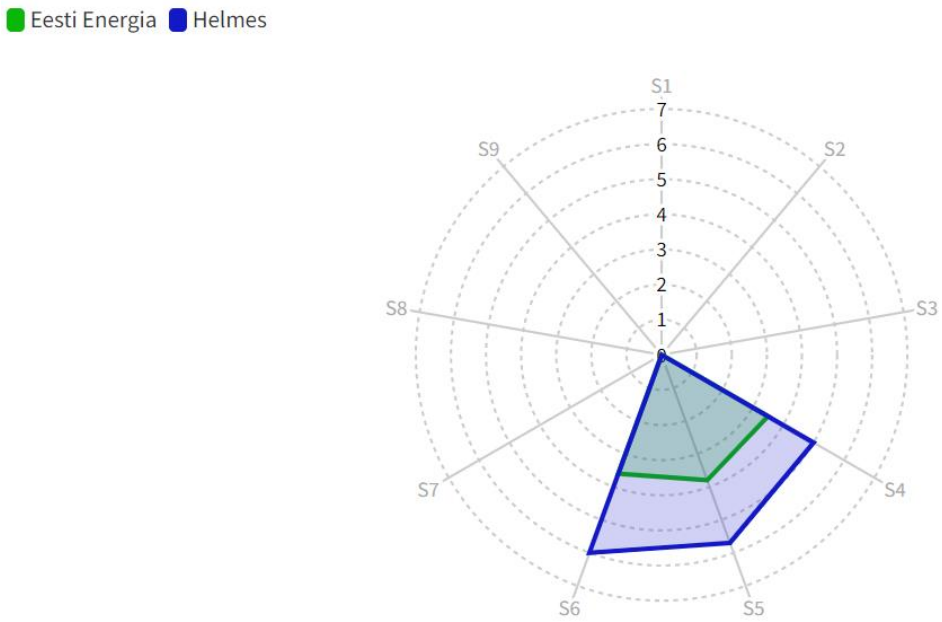

Figure 5. Design & Customer Pillar Radar Chart
Source: Author´s calculations

Based on the semi-structured interviews conducted within Eesti Energia, people feel that there is still misconception for customer centricity inside the organization. The Design & Customer pillar got strong values within the expert organization. Mean score of the pillar was 5,6 with design being 5,0, customer centricity 5,7 and customer experience management 6,0.

Customer experience management is an important part of Helmes organization, as customer feedback (NPS) is one of their three main Key Performance Indicators (KPI). Eesti Energia also tracks NPS, but based on the results from self-assessment survey, the roles and actions have not been set up clearly to address important feedback across organization.

Rest of Helmes KPI´s include employee satisfaction and profitability metric. They have implemented continuous tracking of the main metrics and are data driven. As well as, decision process that emphasise testing and experimentation. On the other hand, in Eesti Energia, the current overview and access to important data is not sufficient. INT6: "…We don't have good access to numbers, convenient access or we just don't, we don't care."

Further, successful companies have digital tools that the company adopted and specialized in across the company. INT3: "…Internal digital tools are one component of the system's internal digital competencies. Well, there is no point in investments if there is inner lack of the ability for people to use it."

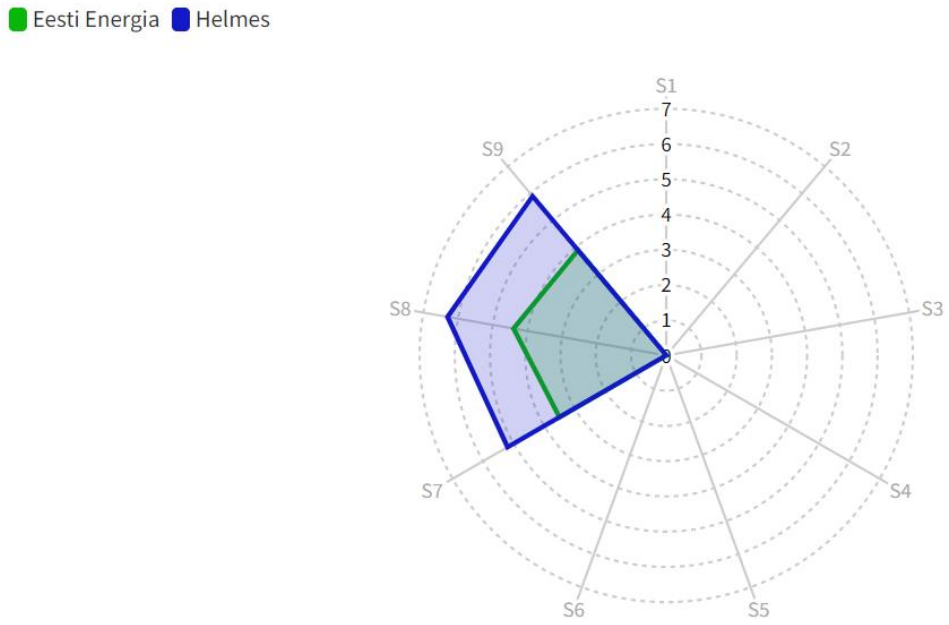

Figure 6. Technology & Data Pillar Radar Chart
Source: Author´s calculations

Within the Technology & Data pillar, the most significant difference is within the topic of architecture and following statement in Question 29: "Teams use automated testing with rapid and continuous realises of product and code. Parts of the process are done in parallel. Advanced supporting tools and infrastructure are used." Eesti Energia mean score is 2,8, compared to Helmes 6,1.

Technology & data results differed in Eesti Energia amongst the competence areas with IT evaluated maturity as 5,2, "Somewhat agree", yet processes and marketing 2,7 and 2,8 respectively. It must be noted that process and marketing managers are cross-product and cross-department roles and results could have been influenced and should not only account for single product development experience.

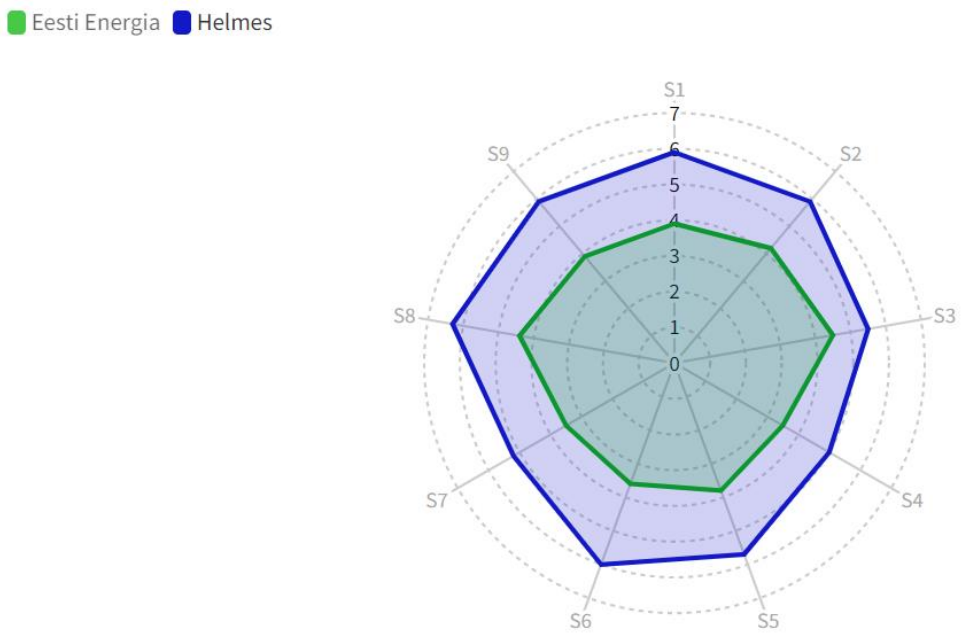

Figure 7. Technology & Data pillar Radar Chart
Source: Author´s calculations

Overall, there semi-structured interviews and self-assessment survey both suggest that there are no one pillar or dimensions that was the key difference between the two companies, but more of having lower score in relatively evenly across pillars and dimensions. The largest difference being related to technology and IT architecture (3,3) and lowest on strategic consensus (0,65). Comparison in each sub-category between the two companies is shown in Annex 3.

Among the traditional organization example, many challenges have been rised aside from the negative scores from self-assessment survey. Braking out of the past understanding is challenging. INT6: "… Our main obstacle is how I myself have perceived and seen it, that it is basically our history and we have very well-established ways of doing things." Further, INT6: "…We do not have a problem of attitude and principles, we have a problem of competence."

Second research question based on Eesti Energias example was - why are traditional companies struggling with transformation towards digitalized new products and service development?

From the semi-structured interviews conducted within Eesti Energia, people feel that there is still misconception for customer centricity inside the organization. Based on the results of self-assessment survey, there is lack of design principles and tools used in the product development

processes such as user personas, user journey and customer research, which origins first from the lack of competence for using design thinking tools within product development processes. The cultural maturity mainly related to agility is altered by decision-making process and lack of autonomy for dedicated teams. Based on self-assessment survey the decision-making process is often described as unclear and not transparent. INT3: "…We have increased our complexity too much. First of all, the foggy matrix of decision-making has landed us, where you don't know exactly who decides what and who comes where to get agreement."

Secondly, the findings showed that there are still some degree of different perceptions in respect of the understanding of current levels of maturity. This is something that should be tracked futher, as misconception of ways of working can lead to brake down of trust and eventually result in bad team performance (Lencioni, 2005). This can be resulted by not having fully empowered product team with full responsibility on the job or task they are performing.

Third research question was – how can traditional companies increase performance of in-house development of digital products?

Main part of increasing performance within traditional organizations on new products and service development is the same understanding this thesis aimed to fulfill – understanding first and foremost, what are the needed components, that act as prerequisites for performance. When understanding the three main pillars and results comparison between Eesti Energia and Helmes, the differences are relatively even across pillars and dimensions. For the question of where are the areas we are treading compared to expert organizations, the following was mentioned: INT3: "…Equally in all areas, it's really true, you lift it link by link like a chain. Otherwise, then you're overinvested in one category."

From expert organization, the most important factor are the people within organization. Expert organization has but a lot effort first to understanding, what are their core values and secondly, recruiting strictly based on this. INT2: "…I've been through this myself, I think I had four or five meetings before I got in." and he continues "…you have to find right people for the right role and everything else will fall into place." As people are the most part of expert organization, they invest in development of the people as well as enabling them trust and possibility to do autonomous work. INT1: "…No central system can prescribe the smartest method people in the field, know they are the ones on the fields and when they are smart, collaborate wisely with each other and the customer, then they exceed expectations."

As mentioned in the previous chapter based on the semi-structured interviews, there is a lack of competence on the area of design and customer understanding in both leadership and specialist level of the company. When talking about the transformation towards fully customer centric organization, INT5: "…there is currently no such competence to manage it. Since Eesti Energia is such a huge ship, it does not change based on one evangelist, there must be such a core team on the board that actually calls change into life and stands for it."

Design thinking implements important aspects of customer centricity and is growing competence within expert organization. Based on the suggestion and also mean scores being 3,5 out of 7 from self-assessment survey, this needs more high-level role to lead traditional company through this change, which would be able to affect every part and team inside the organization. INT6: "…the team, which is now trying to create some kind of design thinking competence is five levels deep down from the CEO. Well, you can guess for themselves, what their mandate is to have a say in the matters of principle."

Having the right people is important, but right people also need possibility to fulfill themselves and have freedom when it comes to decision making in their product. Based on the self-assessment survey results, fully autonomous teams with one joint goal and understanding of the bigger vision must be created. This may not be implementable in every area of the business, but developments and products, which are for end-customers, should be lead by autonomous team with business-line responsibility in order to create feeling of ownership. This will help to increase the self-drive and feeling of belonging within the team. Positive reference case can help to show, that there is better way of doing. INT6: "…Before, I also mentioned that which one had to do, either bottom-up or a top-down one, and I sincerely believe in myself that the real change comes from having one team doing business like a business, decides to do it differently. It takes courage and something like a good experience to make change in a company."

Creating a pilot project with one to two business lines can help, by initially setting clear principles and set of values, defining need capabilities and competences and setting clear ways of working with new setup.

CONCLUSION

This study aimed to create Combined Maturity Model that would include relevant aspects of high-performing, new product and service development teams. This could be achieved by identifying, examining and comparing existing Digital, Agile and Design Maturity Models. The research results of this paper indicate that the existing maturity models are not considering all important factors brought out in expert interviews, literature and are inconsistent in their description across different models. Next, by analysing the literature, existing Maturity Models and expert interviews, Combined Maturity Model was created with the main pillars being Culture & Purpose, Design & Customer and Technology & Data. In short, high-performance team have trust, care and entre- or intrapreneurship embedded in the culture that is influenced by common vision driven by North Start Metric(s). Secondly, they have included customer in the heart of development and have implemented routines to learn and understand about customer problem space, mostly design thinking principles of empathize-define-ideate-prototype-test, hence they are continuously learning about the environment, customer and about their skills and tools as well. Thirdly, technology is at the core of the business with the setup that supports team communication, easy access to data and people in the organization are digitally savvy and capable.

As discussed above, based on Eesti Energias example there are many barriers in order to make successful transformation from electricity seller to customer centric service provider. Lack of competence in key areas such as design thinking and customer experience were identified, as well as lack of autonomy and hindering architecture of IT.

In order to increase performance and likelihood of successful value creation and product development, set of key values and recruitment based of this is needed. Further, to increase customer centricity and create joint understanding of this across organization, it is recommended to include design thinking near executive level of the company, that could affect important areas of the company. Lastly, creating cross-functional teams with full autonomy as separate cells to deliver end-to-end value and take full commitment of the results can act as a positive reference case to impact bigger change within the company in order to further develop autonomy and trust. The model developed was tested within two companies in different sectors (IT and Energy), but would be needed to carry out larger scale testing across multiple sectors. Future work in this area includes creating a Maturity Model that more directed to individual teams and the psychological aspects of teams, that can predict success and track health within it. The team background,

competence level and experience should be taken in consideration. Furthermore, Maturity level compared to main performance indicators should be addressed to understand Combined Maturity effect on results and well-being of the employees.

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APPENDIXES

Appendix 1. Semi-structured interviews possible questions

EXPERT ORGANIZATION (Helmes AS)

INTRODUCTION

1. Please describe your current your position, work experience.
2. How would define success when it comes to product teams and organizations?

RQ1: Why are traditional companies struggling with transformation towards digitalized new products and service development?

3. What to do you think are the main barriers for traditional companies or any other in making successful digitalization transformation?
4. Based on your experience with cooperating with traditional companies ordering services from you, what are the main differences and where these companies are lacking of?

RQ2: What are the main components of high-performance, agile new products and service development organizations and differences with traditional companies?

5. What is that your organization does and how is being product development executed in your organization?
6. What do you think are the main components behind successful digital products?
7. What are the main critical roles within organizations to build, in order to carry out successful transformation?
8. What do you think are the main differentiation between mediocre cross-functional teams and great teams?
9. What are your main indicators or North Star Metric within the organization?

RQ3: How can traditional companies increase performance of in-house developed digital products?

10. What are your main strategies for increasing performance within teams that may be lacking?
11. What do you think traditional companies can to in order to increase likelihood of success in digitalization?
12. How to you increase purpose within your organization and build culture? Do you think it is important?
13. What are the main values you carry within your organization and teams to build culture?
14. How have you incorporated customers in development / design processes? Do you think it is important?
15. How have you integrated data in decision making processes? Do you think it is important?
16. Do you have anything to add?

TRADITIONAL ORGANIZATION (Eesti Energia)

INTRODUCTION

1. Please describe your current your position, work experience.
2. How would define success when it comes to product teams and organizations?

RQ1: Why are traditional companies struggling with transformation towards digitalized new products and service development?

3. What do you think are the main components of digitalization transformation including development of new product and services?
4. Why do you think traditional companies are struggling with building new products and services?
5. What are the main barriers you have felt within the organization during the process of developing new products and services?
6. How well has your organization established culture & purpose and is it cohesive across the organization?
7. What is our organization lacking in terms of transformation? (Not enough competence and right people, autonomy for product development teams, leadership involvement, tools and processes etc.)

RQ3: How can traditional companies increase performance of in-house developed digital products?

8. What do you think your organization can to in order to increase likelihood of success in digitalization?
9. How can your organization increase purpose within your organization and build culture? Do you think it is important?
10. How can your organization incorporate customers more in development / design processes? Do you think it is important?
11. How can your organization incorporate integrated data more in decision making processes? Do you think it is important?
12. Do you have anything to add?

Appendix 2. ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	115,3079	10	11,53079	5,095905	6,33E-07	1,859441
Within Groups	746,7097	330	2,262757			
Total	862,0176	340				

Table 8. ANOVA Eesti Energia AS
Source: Author´s calculations

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	225,5392	6	37,58986	37,3375	1,2E-30	2,141943
Within Groups	211,4194	210	1,006759			
Total	436,9585	216				

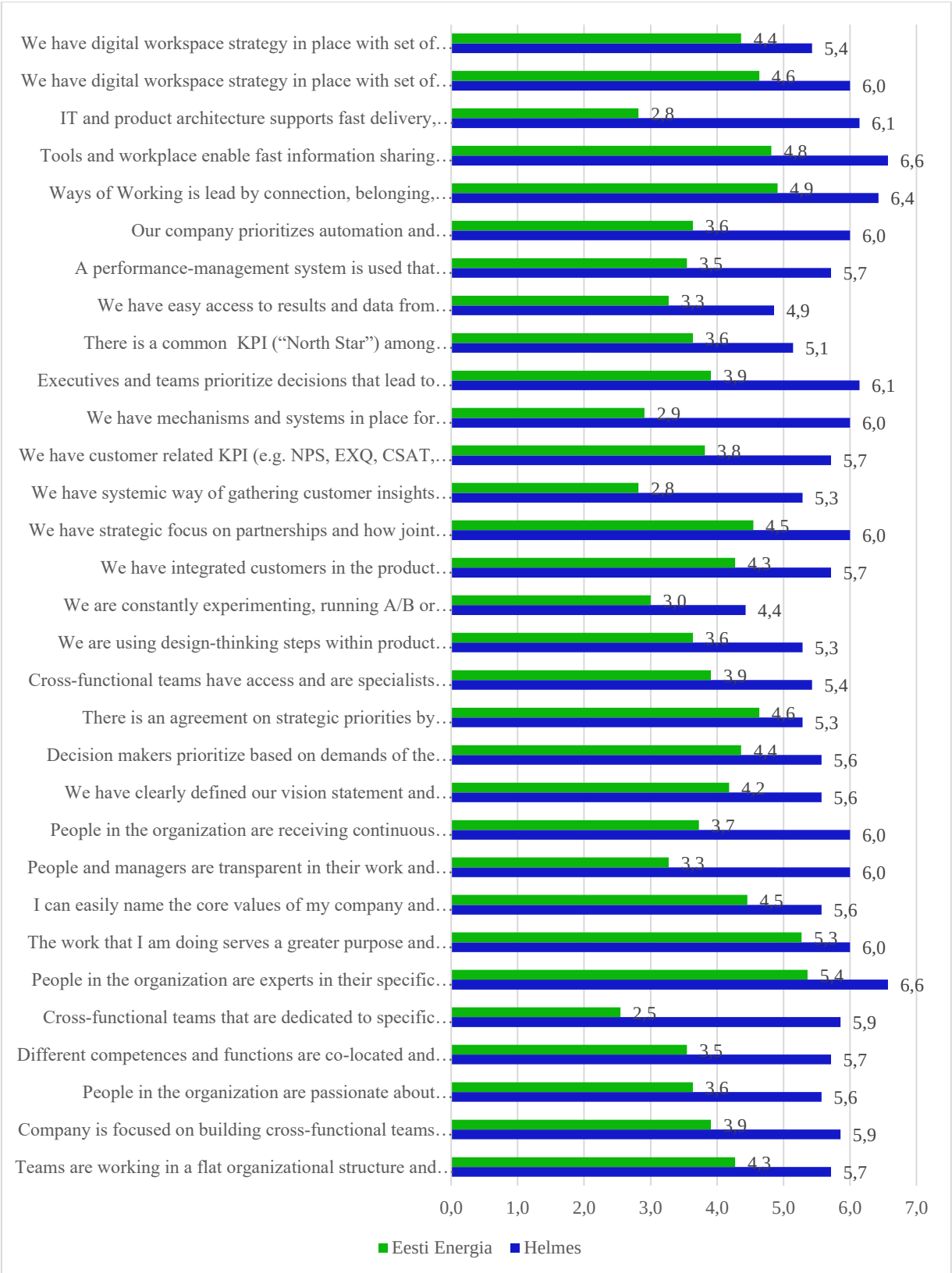
Table 9. ANOVA Helmes AS
Source: Author´s calculations

Comparison	*Absolute difference*	*critical range*	*results*
IT vs Business & product development	0,1	1,6	Not significantly different
IT vs Marketing	1,2	1,6	Not significantly different
IT vs Processes	1,0	1,6	Not significantly different
IT vs design	0,3	1,6	Not significantly different
Business & product development vs marketing	1,1	1,6	Not significantly different
Business & product development vs processes	0,9	1,6	Not significantly different
Business & product development vs design	0,1	1,6	Not significantly different
Marketing to processes	0,2	1,6	Not significantly different
Marketing to design	1,0	1,6	Not significantly different

Processes to design	0,8	1,6	Not significantly different

Table 10. Tukey-Kramer method based on Eesti Energia self-assessment survey
Source: Author´s calculations

Appendix 3. Self-assessment comparison



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